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Application Serial No. 10/577,017
Reply to final office action of April 28, 2010PATENT
Docket: CU-4798Amendments to the Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) An electronic device comprising:
an electronic element; and
an interposer including an interposer base to which the electronic element is joined, and a plurality of post electrodes connected to corresponding electrodes of the electronic element;

wherein the electronic element and the interposer base are made of silicon and the interposer base comprises a silicon wafer piece,

said interposer base being defined by an upper principal surface, a lower principal surface and a sidewall surface connecting said upper principal surface and said lower principal surface, said plurality of post electrodes extending between said upper principal surface and said lower principal surface of said interposer base so as to penetrate through the silicon wafer piece, each of said plurality of post electrodes having a top end exposed at said upper principal surface, each of said plurality of post electrodes having a bottom end exposed at said lower principal surface,

said electronic element having a top principal surface in direct contact with said lower principal surface of said interposer, said electronic element carrying said plurality of electrodes respectively in correspondence to said plurality of post electrodes in a state buried in said electronic element, said plurality of electrodes being exposed at said top principal surface of said electronic element and in contact with corresponding bottom ends of said plurality of post electrodes, said plurality of electrodes forming a flush surface with said top principal surface of said electronic element,

a rewiring layer being formed upon said top end of said post electrode in electrical connection therewith,

an external connection terminal being formed on a top surface of said rewiring layer.

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2. (currently amended) An electronic device comprising:
 - an electronic element; and
 - an interposer including an interposer base to which the electronic element is joined, and a plurality of post electrodes that are disposed inside one or more through holes formed in the interposer base and are connected to corresponding electrodes of the electronic element,
wherein the electronic element and the interposer base are made of silicon and the interposer base comprises a silicon wafer piece,
said interposer base being defined by an upper principal surface, a lower principal surface and a sidewall surface connecting said upper principal surface and said lower principal surface, said one or more through holes extending between said upper principal surface and said lower principal surface of said interposer base so as to penetrate through the silicon wafer piece, each of said plurality of post electrodes having a top end exposed at said upper principal surface, each of said plurality of post electrodes having bottom end exposed at said lower principal surface,
said electronic element having a top principal surface in direct contact with said lower principal surface of said interposer, said electronic element carrying said electrodes respectively corresponding to said plurality of post electrodes in a state buried in said electronic element, said plurality of electrodes being exposed at said top principal surface of said electronic element and in contact with corresponding bottom ends of said plurality of post electrodes, said plurality of electrodes forming a flush surface with said top principal surface of said electronic element,
a rewiring layer being formed upon said top end of said post electrode in electrical connection therewith,
an external connection terminal being formed on a top surface of said rewiring layer.

3. (original) The electronic device as claimed in claim 1 or 2, wherein the electronic element and the interposer base are made of the same material.

4. (cancelled)

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5. (currently amended) The electronic device as claimed in claim 1 or 2, wherein the electronic device comprises a first insulation layer formed at least in a position on the electronic element to be joined to the interposer base; and the interposer base comprises a second insulation layer formed at least in a position on the interposer base to be joined to the electronic element.
6. (original) The electronic device as claimed in claim 2, wherein the post electrodes are formed in the single through hole.
7. (original) The electronic device as claimed in claim 1 or 2, wherein a recess is formed in the interposer base such that the electronic element is accommodated in the recess.
8. (original) The electronic device as claimed in claim 1 or 2, wherein plural of the electronic elements are mounted to the interposer base.
9. (original) The electronic device as claimed in claim 1 or 2, wherein a back surface of the electronic element is joined to the interposer base.
10. (original) The electronic device as claimed in claim 1 or 2, wherein a sealing resin encapsulating the electronic element is disposed on the interposer base.
11. (original) The electronic device as claimed in claim 1 or 2, wherein the electronic element is a semiconductor chip.
12. (original) The electronic device as claimed in claim 1 or 2, wherein the electronic element is a passive element.
- 13-15. (canceled)

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16. (currently amended) An electronic device comprising:
an electronic element; and
an interposer to which the electronic element is joined, and the interposer
including an interposer base, said interposer base comprising a silicon wafer piece and
said interposer base being defined by an upper principal surface, a lower principal
surface and a sidewall surface connecting said upper principal surface and said lower
principal surface;

wherein said lower principal surface of said interposer base being in direct
contact to a top principal surface of said electronic element, and

wherein the electronic element ~~and the interposer base are~~ is made of silicon,
said electronic element having a top principal surface in direct contact with
said lower principal surface of said interposer, said electronic element carrying
electrodes respectively corresponding to a plurality of post electrodes
penetrating through said interposer base from said lower principal surface to said
upper principal surface of said interposer base in a state buried in said electronic
element, said plurality of electrodes being exposed at said top principal surface
of said electronic element and in contact with corresponding bottom ends of said
plurality of post electrodes, said plurality of electrodes forming a flush surface
with said top principal surface of said electronic element,

a rewiring layer being formed upon said top end of said post electrode in
electrical connection therewith,

an external connection terminal being formed on a top surface of said
rewiring layer.

17. (original) The electronic device as claimed in claim 16,
wherein the electronic element is an optical device; and
the interposer is provided with an optical waveguide optically connected to the
optical device.

18. (previously presented) The electronic device as claimed in claim 1, wherein the
portion of the interposer base and the portion of the electronic element that are in direct
contact with each other are the same material.

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19. (new) The electronic device as claimed in claim 1, wherein said external connection terminal is formed on an end of said rewiring layer opposite to the end connected to said post electrode.
20. (new) The electronic device as claimed in claim 2, wherein said electrodes of said electronic element are provided at a side of said lower principal surface of said interposer base, and wherein said external connection terminal is provided at a side of said upper principal surface of said interposer base.
21. (new) The electronic device as claimed in claim 16, wherein said electrodes of said electronic element are provided at a side of said lower principal surface of said interposer base, and wherein said external connection terminal is provided at a side of said upper principal surface of said interposer base.